

R E M A R K S

The amendments to claim 1 involving "iron" are supported in the first paragraph on page 1 of the specification.

Editorial revisions were made to some of the withdrawn method claims.

New claim 70 is supported in the specification on page 60, lines 19 to 26.

For new claims 71 and 72, the average metallization degrees of 10, 20, 30 and 40, respectively, are described in the specification on page 62, lines 23 to 25; page 60, lines 19 to 23; page 57, line 15 to page 58, line 2; and page 69, lines 9 to 16.

Claim 1 was rejected under 35 USC 112, second paragraph for the reasons set forth at the middle of page 4 of the Office Action.

Claim 1 was amended to avoid the 35 USC 112, second paragraph rejection.

It is respectfully submitted that the present claims comply with all the requirements of 35 USC 112.

Claim 1 was rejected under 35 USC 103 as being unpatentable over Kundrat et al. USP 5,702,502 for the reasons set forth in the paragraph bridging pages 3 and 4 of the Office Action.

Kundrat et al. USP 5,702,502 relates to a three-stage process for smelting and refining chromite ore to obtain chromium units during the manufacturing of stainless steel (see column 1, lines 6 to 8 of Kundrat et al.).

The presently claimed invention relates to a metal smelting of iron ore containing iron oxide and/or iron hydroxide (see applicants' claim 1).

The smelting reduction of iron ore of the presently claimed invention is substantially different from that of chromite ore of Kundrat et al.

The object of Kundrat et al. is to produce inexpensive metallic Cr units from an inexpensive chemical grade raw chromite material ore or concentrate.

It is an object of the present invention to provide a method for metal smelting that can manufacture molten iron with a high production efficiency of the total process and a high productivity by melt-reducing an iron oxide and/or an iron

hydroxide, such as iron ore. Kundrat et al. does not teach or suggest the production efficiency of the total process as achieved by the presently claimed invention.

The presently claimed invention which comprises a preliminary reducing step (A1) and a melting and finally reducing step (B1) was discovered based on the following findings:

(1) When the metallization degree of a semi-reduced iron obtained from a RHF (rotary hearth type furnace) is brought to a high level of 60% or more as in the case of the prior art, the production efficiency of the total process, or the unit requirement of energy consumption and the energy balance, is degraded.

(2) By suppressing the metallization degree of semi-reduced iron to a specified low level, the production efficiency of the total process is effectively improved, while attaining high productivity.

(3) A lower metallization degree of semi-reduced iron is extremely advantageous with respect of the unit requirement of energy consumption and energy balance.

(4) The difficulties in the prior art which occurred due to the preliminary reduction smelting of a mixture of raw materials in a RHF are completely solved by the present invention, wherein high productivity is attained, and the manufacturing cost and the investment cost in the preliminary reduction smelting are decreased (see page 9, lines 5 to page 10, line 4 of the present specification).

Kundrat et al. do not refer to the relationship between the metallization degree of semi-reduced iron and energy consumption which is shown in applicants' Fig. 4.

The presently claimed invention specifies an average metallization degree of semi-reduced iron manufactured in a prereduction furnace such as a RHF of from 5 to 55%. Kundrat et al. do not teach or suggest such range of average metallization degree of from 5 to 55%. On the other hand, Kundrat et al. describe in column 18 lines 49 to 52 that said "increased premetallization degree and accompanying high Cr yield have a big impact on production cost". Therefore, Kundrat et al. teach that a higher premetallization degree is advantageous.

Appl. No. 10/085,797
Amdt. dated August 28, 2003
Reply to Office Action dated March 14, 2003

It is therefore respectfully submitted that applicants' claimed invention is not rendered obvious by the reference.

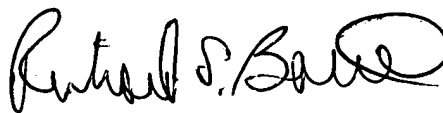
Reconsideration is requested. Allowance is solicited.

A check for \$54.00 is enclosed in payment of three additional claims.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Frishauf, Holtz, Goodman
& Chick, P.C.
767 Third Ave., 25th Floor.
New York, NY 10017-2023
Tel. Nos. (212) 319-4900
(212) 319-4551/Ext. 219
Fax No.: (212) 319-5101
E-Mail Address: BARTH@FHGC-LAW.COM
RSB/ddf

Respectfully submitted,



Richard S. Barth
Reg. No. 28,180

Encs.: (1) PETITION FOR EXTENSION OF TIME
(2) Check for \$54.00